ANNUAL REPORT

OF

THE KEEPER

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

AT HARVARD COLLEGE,

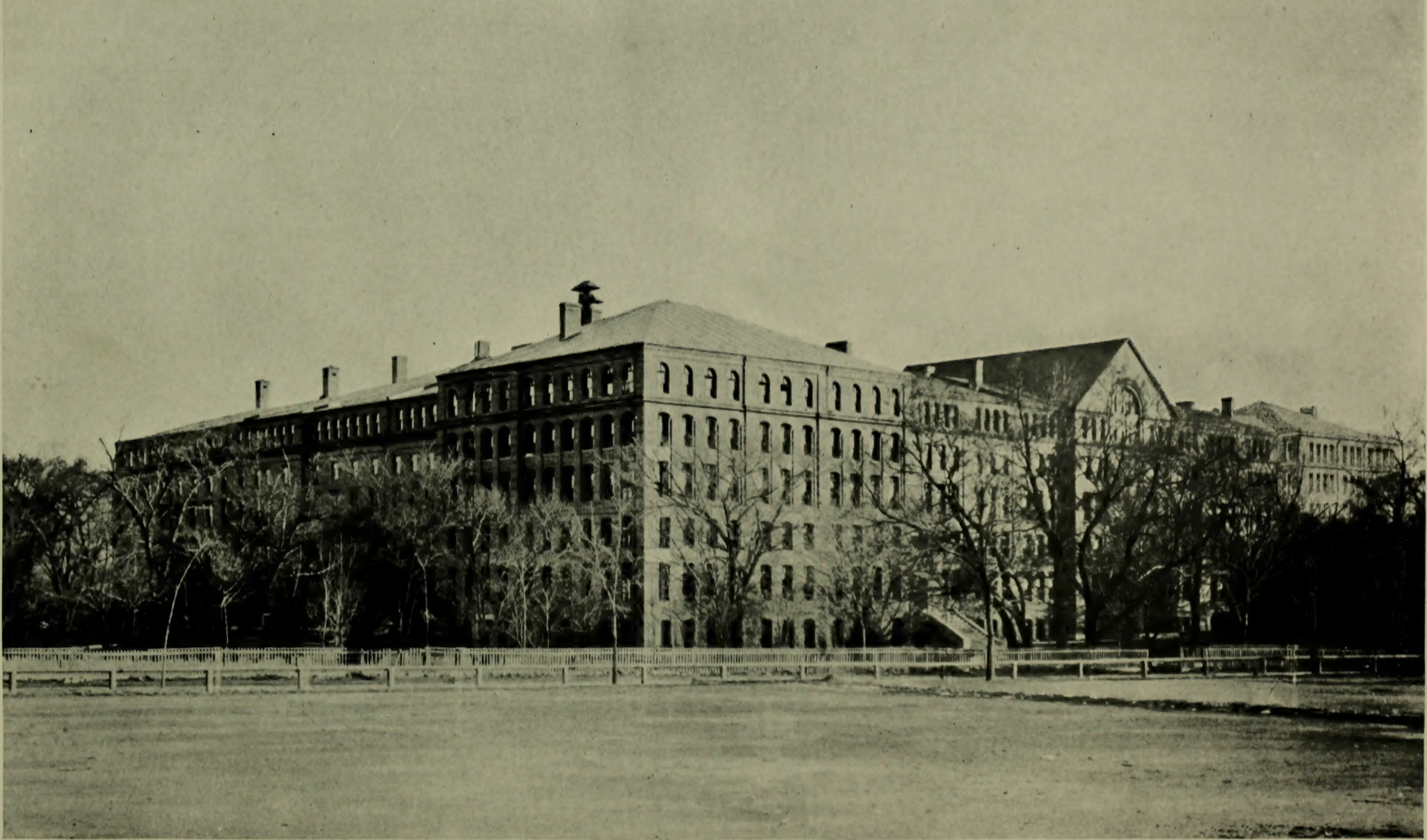
TO THE

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

FOR

1901-1902.

CAMBRIDGE, U. S. A.:
UNIVERSITY PRESS: JOHN WILSON AND SON
1902.



UNIVERSITY MUSEUM, NORTH AND WEST WINGS FROM N. W.

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LIBRARY
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1902.

MUSEUM OF COMPARATIVE ZOÖLOGY.

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HENRY P. WALCOTT.
——— ———, *Curator.*
GEORGE L. GOODALE.
ALEXANDER AGASSIZ, *Secretary.*

Committee on the Museum.

HENRY P. WALCOTT.
GEORGE L. GOODALE.

Officers.

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WALTER FAXON	*Assistant in Charge of Crustacea and Mollusca.*
SAMUEL GARMAN	*Assistant in Herpetology and Ichthyology.*
WILLIAM BREWSTER	*Assistant in Ornithology.*
SAMUEL HENSHAW	*Assistant in Entomology and Librarian.*
C. R. EASTMAN	*Assistant in Vertebrate Palæontology.*
OUTRAM BANGS	*Assistant in Mammalogy.*
FRANCES M. SLACK	*Librarian Emerita.*
MAGNUS WESTERGREN	*Artist.*

NATHANIEL S. SHALER	*Professor of Geology.*
WILLIAM M. DAVIS	*Sturgis-Hooper Professor of Geology.*
EDWARD L. MARK	*Hersey Professor of Anatomy.*
ROBERT T. JACKSON	*Assistant Professor of Palæontology.*
GEORGE H. PARKER	*Assistant Professor of Zoölogy.*
ROBERT DeC. WARD	*Assistant Professor of Climatology.*
JAY B. WOODWORTH	*Assistant Professor of Geology.*

Instructors and Assistants in the Laboratories of Zoölogy and Geology.

WILLIAM E. CASTLE	*Instructor in Zoölogy.*
THOMAS A. JAGGAR, Jr.	*Instructor in Geology.*
MOTTE A. READ	*Instructor in Physiography.*
HERBERT W. RAND	*Instructor in Zoölogy.*
AMOS W. PETERS	*Assistant in Zoölogy.*
GRANT SMITH	*Assistant in Zoölogy.*
FREDERIC W. CARPENTER	*Assistant in Zoölogy.*
FREDERICK M. WILDER	*Assistant in Meteorology.*
JAMES W. GOLDTHWAIT	*Assistant in Geology.*
JOSEPH A. CUSHMAN	*Assistant in Palæontology.*

REPORT.

To the President and Fellows of Harvard College: —

During the past academic year the regular courses in Zoölogy, Geology, Geography, and Meteorology were given in the laboratories of the Zoölogical Section of the Museum. During the second half year some of the courses under the Department of Geology were transferred to the new southwest corner-piece, the Geological Section of the Museum.

Eleven courses in Zoölogy were given by Professors Mark, Jackson, Parker, Drs. Castle and Rand, assisted by Messrs. Breed, Carpenter, Ordway, Peters, and six sub-assistants. These courses were attended by two hundred and sixty-seven students. Five courses in Zoölogy were given to thirty-five students of Radcliffe College.

Seventeen courses under the Department of Geology were given by Professors Shaler, Davis, Jackson, Ward, J. B. Woodworth, and Dr. Jaggar, assisted by Messrs. Goldthwait, Wilder, and Woodman, and three sub-assistants. These courses were attended by five hundred and sixty-nine students. Six courses in Geology were attended by sixty students of Radcliffe College.

In Professor Ward's report will be found a detailed account of the equipment and assignment of the rooms in the new Geological Section of the University Museum. It is doubtful if any Geological Department connected with an institution of learning is so comfortably and liberally housed as that of Harvard University in its University Museum. The two plates accompanying this Report show at a glance the great structure planned by Louis Agassiz and the building periods through which it has passed in forty-three years. But one hundred feet of the south wing are needed to realize the plan of its distinguished founder and give to Harvard University a Museum with Laboratories of Natural History suited to its needs.

The Corporation of the University has added materially to the efficiency of the fire apparatus of the Museum by installing new stand-pipes and hand fire-extinguishers of the "Underwriter" pattern.

The withdrawal of the Department of Geology has necessitated a thorough overhauling and renovation of the rooms occupied by them as well as the old Zoölogical Laboratories. In addition to painting and plastering, new floors have been laid in five of the rooms. The Department of Zoölogy, including Palæontology, now has thirteen laboratories and lecture rooms, besides a workshop, photographic room, vivarium, and an aquarium in the basement, providing the Department with facilities for instruction and research of which it has been much in need.

The chief additions to the exhibition rooms consist of two very large mounted specimens of the great land tortoises of the Galapagos Islands in the Pacific Room, and the installation in the Atlantic Room of the microscope and mounted collection of "Albatross" Foraminifera presented by Dr. J. M. Flint, U. S. N. The different Museum Assistants report that the collections are in good condition. Among the many accessions the most noteworthy are Mr. Scudder's gift of his extensive collection of early stages of Butterflies, and Dr. Thaxter's collection of Moths. The Museum has received from Mr. Frank Springer all of the material for his monograph of Uintacrinus, given some time ago.

The library shows an ever-increasing number of accessions. More than five thousand five hundred volumes, parts of volumes, and pamphlets were added during the past year. Eighty volumes were added to the library of the Entomological Department from the income of the Willard Peele Hunnewell Memorial Fund. The rapid growth of the library and the increasing demands upon it by the students of the University and those of Radcliffe College call for a greater expenditure from the general funds of the Museum for its maintenance. Funds are much needed for library purposes, — such as funds for special departments and a binding fund. The Hunnewell Fund is the only one now at the disposal of the Museum exclusively for library uses.

The publications during the past year have been more than the usual number. Seven numbers of the "Bulletin" with 341 pages and 42 plates, and six numbers of the "Memoirs" with 438 pages and 76 plates, were issued. Five of the six "Memoirs" are reports of the Results of Mr. Agassiz's "Blake" and "Tropical

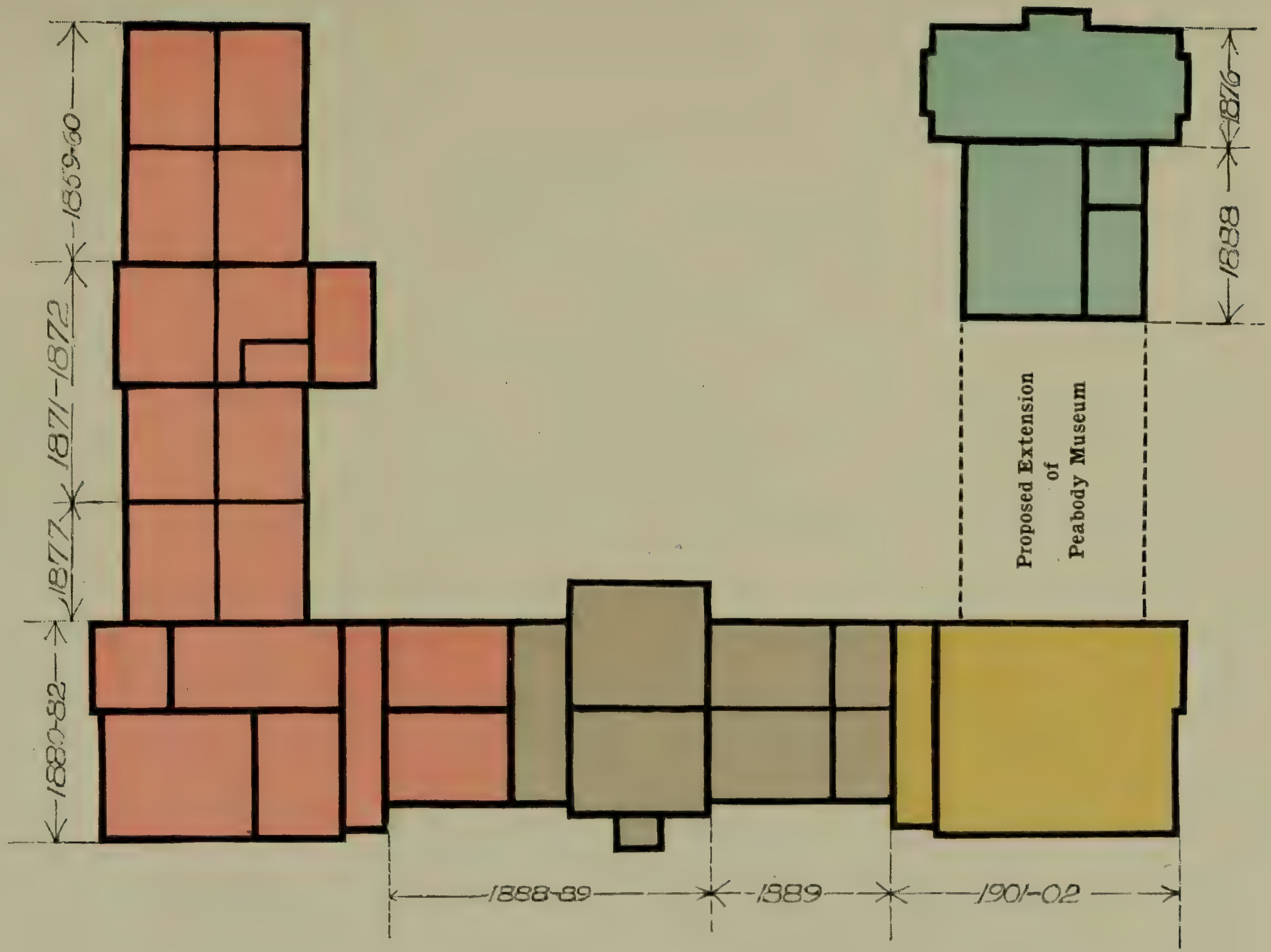
Pacific" Expeditions. These include two numbers of the "Blake" series (Nos. XXXIX. and XL.), the Dromiacea and Oxystomata, and Bathynomidæ by Milne Edwards and Bouvier; Mr. Agassiz's Preliminary Report (No. I.) of the "Tropical Pacific Expedition" and (Nos. II. and III.) the Medusæ by Mr. Agassiz and A. G. Mayer, and the latter's Report on Partula, Volumes XXXVIII., XXXIX., XL., and XLI. of the "Bulletin," and Volumes XXV., XXVI., XXVII., and XXVIII. of the "Memoirs" are in course of publication.

In November of last year, I accompanied Mr. Agassiz on his expedition to the Maldive Islands, the only group of atolls that he had not seen in his extensive studies of coral formations. Mr. Agassiz also took with him as assistants his son Maximilian and Mr. H. B. Bigelow. The expedition started from Colombo on the Steamer "Amra," chartered from the British India Steam Navigation Co., and commanded by Captain Wm. Pigott, R. N. R. One month was spent in exploring the atolls of the Maldive group. More than eighty soundings were made with a Lucas machine in 1,500 fathoms and under, and a splendid series of over three hundred photographic negatives were secured, the weather being most favorable at all times. Towing with intermediate nets down to 150 fathoms was done, as well as surface towing, bottom dredging, and shore collecting as time permitted. The results of the expedition were most satisfactory in every way, and to the interest and zeal of Captain Pigott and the officers of the "Amra" is due much of its success. Thanks are also due to the British Colonial Office and the officials at Ceylon, to Messrs. Bois Bros. & Co., the agents of the British India Steam Navigation Co., and to his Highness the Sultan of the Maldives. Several Reports of the results of the expedition are nearly ready for the printer. Again I am indebted to Mr. Samuel Henshaw for assuming charge of the Museum during my absence.

It is with regret that I have to record the death of Alpheus Hyatt, Museum Assistant in Invertebrate Palæontology. Professor Hyatt was one of the early students of Louis Agassiz. He is mentioned in the first annual Report of the Museum for 1859, and his name occurs throughout the series, as from his student days he worked more or less continuously on the collections. He served the Museum as Assistant in Palæontology from 1885 up to the time of his death in 1901, the greater part of the time without salary. He was inspiring as a teacher, and his work as an investigator has left a lasting impression in the fields of Invertebrate Palæontology. His genial and kindly nature endeared him to his associates. In accordance with his expressed wish, all of the types in his personal collection are given to the Museum, the remainder of the collection being divided between the Museum and the Boston Society of Natural History. From his library the Museum has also received upwards of 800 volumes and pamphlets.

I have also to record the death of Eli Goodrow, for more than thirty-six years the devoted and faithful Janitor of the Museum; he had served the Museum almost from its beginning, and the evidences of his handiwork throughout the building show his interest in its growth and development.

W. McM. WOODWORTH,
Keeper of the Museum.



PLAN OF UNIVERSITY MUSEUM.

RED—Museum of Comparative Zoölogy. GRAY—Botany, Mineralogy.
YELLOW—Geology. BLUE—Peabody Museum of Archæology and Ethnology.

REPORT ON THE ZOÖLOGICAL LABORATORY.

By Professor E. L. Mark.

The following table gives the number of students in the various classes of Harvard College, the Lawrence Scientific School, and other departments of the University, who were in attendance on the several courses in Zoölogy during the College year 1901–02, the numbers printed in italics indicating Scientific-School students: —

Courses. 1901–02.	Grad.	Sen.	Jun.	Soph.	Fresh.	Spec.	Bussey.	Instr.	Total.
Zoölogy 1	1	12 + *3*	23 + *3*	25 + *6*	31 + *10*	6 + *6*	1		99 + *28* = 127
" 2	2	6	6 + *1*	12 + *5*	6	+ *2*			32 + *8* = 40
" 3	6	7 + *1*	5 + *7*	3 + *5*		1 + *3*			22 + *16* = 38
" 4	3	3 + *1*	1 + *1*	+ *4*		+ *1*			7 + *7* = 14
" 5	3	3	1	+ *3*					7 + *3* = 10
" 9	3		+ *1*						3 + *1* = 4
" 9 *a*			+ *1*			+ *1*			+ *2* = 2
" 11	7		1						8 8
" 13	4	1 + *1*		1				1	7 + *1* = 8
" 15	3	1 + *1*		1					5 + *1* = 6
" 20*a*	9	+ *1*							9 + *1* = 10
									199 + 68 = 267

The corresponding information about students of Radcliffe College is given in a second table: —

Courses. 1901–02.	Grad.	Sen.	Jun.	Soph.	Fresh.	Spec.	Total.
Zoölogy 1		3	1	7	3	2	16
" 2			1	2	2	2	7
" 3	1	1	1			2	5
" 4	2		1			1	4
" 20 *a*	2	1					3
							35

There has been no change during the year in instructors, nor in their rank, and the courses have been carried on in most cases substantially as in the preceding year. The assistants in the several courses are named in connection with the statements about the work of the courses.

In Zoölogy 1 the students have been required, as in 1901–02, to concentrate their laboratory work. Professor Parker has had as Chief Assistant Mr. R. S. Breed, and as Sub-Assistants, Messrs. Grant Smith, Chauncy Juday (who was early obliged to withdraw from the University on account of serious sickness), and J. M. Johnson. The Assistant in the course given to students of Radcliffe College was Mr. C. W. Hahn. It is proposed hereafter to devote half an hour of each three-hour laboratory exercise to an informal review and quiz.

The lectures in Zoölogy 2, by Dr. Castle, were substantially like those of previous years. The laboratory exercises were somewhat changed. The flat-worm type was studied in permanent entire preparations and in prepared sections of the ectoparasite Bdelloura. By shortening somewhat the time hitherto devoted to the anatomy of the frog, it was possible to give some attention to the external features of the metamorphosis of the tadpole. The Chief Assistant in the course was Mr. A. W. Peters, the Sub-Assistants Messrs. C. H. Lander and J. A. Long. The Assistant in the course given to Radcliffe students was Mr. Grant Smith.

The number of lectures in Zoölogy 3 was increased from sixty-one, the number given in 1900–01, to sixty-six. The course was attended by a larger number of students than in any previous year, forty-one having been enrolled. The laboratory work was with the same representatives of the classes of vertebrates as previously, except that the cat was dissected in place of the rabbit, satisfactory arrangements having been made for procuring material. Dr. Rand had as Chief Assistant Mr. F. W. Carpenter; as Sub-Assistant, Mr. M. E. Stickney. The Assistant in the corresponding Radcliffe College course was Mr. W. P. Hager. It is hoped that in the future some time spent by students in the routine labor of preparing skeletons can be saved by providing multiple sets of certain of the skeletons studied.

In Zoölogy 4 less attention than usual was given in the lectures to bibliographic methods. In the laboratory fewer methods were employed and more time given to the study of preparations of the animal selected — as usual, Glossiphonia. As in former years, a certain number of lectures were given on the anatomy and histology of this leech.

The lectures in Zoölogy 5 were given by Professor Mark, as usual, the ground covered being the general development of Vertebrates, not including organogeny, but embracing the discussion of many theoretical problems. The laboratory work in both Zoölogy 4 and 5 was under the supervision of Dr. Rand, who also supervised the laboratory exercises of Radcliffe students in Zoölogy 4.

Both of Professor Jackson's courses on Fossil Invertebrates — Zoölogy 9 and Zoölogy 9*a* — were given. It seems probable that the plan of dividing Zoölogy 9 into two half-courses has been justified by this year's experience.

The general subjects dealt with by Dr. Castle in the lectures of Zoölogy 11 were Variation and Heredity. The effects of close-breeding and of cross-breeding in relation to variation, and the subject of hybridization were considered in some detail, and, among others, the following topics were discussed: the relation of local races to species, especially when interbred; the part played by sports in race-formation; the nature and causes of prepotency, telegony, xenia, grafts, and graft-hybrids. A number of interesting topics were assigned to members of the class for laboratory work, from several of which important results have been obtained.

Dr. Castle has himself continued his breeding experiments with mice and with guinea pigs. Incidental to the main inquiry, which has not yet reached a final solution, certain interesting problems have arisen. A four-toed race of guinea pigs is being rapidly established, certain individuals having yielded more than fifty per cent of young that possess this peculiarity. As the race becomes established, it is proposed to study statistically the heredity of the four-toed character in cross-breeding with normal individuals. An experiment of close-breeding with guinea pigs has been carried successfully through several generations, and its results are being carefully studied.

Zoölogy 13 was conducted by Professor Parker as in 1900–01, except for a few minor changes. In Zoölogy 15 there were, besides the regularly enrolled students, three others who attended all the lectures. Four of the topics assigned to individual students for investigation have yielded results that are to be presented for publication.

Nine students were engaged in research (Zoölogy 20*a*) under the supervision of Professor Mark. Three of these have completed papers which are ready for publication. Two students in Radcliffe College also carried on researches under direction of Professor Mark, and a third, who was not enrolled, was assisted during a part of the year in some researches in cytology.

In future the duty of supervising the researches of advanced students will not fall wholly on the Director of the Laboratory, but will be shared by all the Faculty members of the department.

Mr. H. Crawley, though not a student in the department during the year, has published in the Proceedings of the Academy of Natural Sciences of Philadelphia a paper on "The Progressive Movements of Gregarines," the work on which was begun here during the year 1900–01. Mr. A. W. Peters has made good progress with his work on the metabolism of Infusoria. The final paper on Reissner's fibre by Mr. P. E. Sargent is nearly ready for publication. Mr. C. H. Lander has finished a study of the anatomy and histology of Hemiurus crenatus. Other papers were completed by candidates for the Doctor's degree.

During the current year Dr. Rand has published No. 126 of the Contributions from this Laboratory, and also numerous abstracts and reviews in the "American Naturalist." Professor Parker had the editorial management of the "American Naturalist" during the absence of Dr. W. McM. Woodworth, from November till March, and besides contributing reviews to that journal and to "Science," has published No. 133 of the Contributions from this Laboratory and also the results of work carried on for the U. S. Fish Commission: "The Reactions of Copepods to Various Stimuli and the Bearing of this on Daily Depth Migrations," in Bull. U. S. Fish Comm. 1901, pp. 103–123.

In June, 1902, the degree of Doctor of Philosophy was conferred upon two candidates in Zoölogy, Mr. Robert Stanley Breed, whose thesis was on "The Changes which occur in the Muscles of a Beetle (Thymalus marginicollis Chevr.) during Metamorphosis"; and Mr. William Martin Smallwood, whose thesis was entitled "The Maturation, Fertilization, and Early Cleavage of Bulla solitaria."

Dr. Breed has been appointed Professor of Biology and Geology in Allegheny College, Meadville, Pa., and Dr. Smallwood has received an appointment as Assistant Professor of Zoölogy in the University of Syracuse.

Upon recommendation of the Division of Biology, Dr. Charles W. Prentiss was reappointed to a Parker Fellowship for the year 1902–03. His first year abroad was spent at Freiburg i. Br. and at the Naples Zoölogical Station, where he was the occupant of the Smithsonian Table for a number of months.

The Virginia Barret Gibbs Scholarship for 1901–02 was held by Mr. W. Martin Smallwood. Eleven persons, instructors and advanced students, have been carrying on studies at the Laboratory of the U. S. Fish Commission at Wood's Hole during the summer of 1902. Of these, eight have received aid from the Humboldt Fund.

The meetings of the Zoölogical Club were held on Thursday afternoons throughout the year.

The transference of the instruction in Geology to the new southwest corner of the University Museum has made it possible to assign to the Department of Zoölogy several additional rooms, which, with the alterations and renovation of present quarters, will give the department much better facilities for instruction, and especially ample space for research students.

Contributions from the Zoölogical Laboratory for the Academic Year 1901–02.

126. Rand, H. W. — The Regenerating Nervous System of Lumbricidæ and the Centrosome of its Nerve Cells. Bull. Mus. Comp. Zool., Vol. 37, No. 3, pp. 83–164. 8 pls. September, 1901.
127. Frandsen, P. — Studies on the Reactions of Limax maximus to Directive Stimuli. Proc. Amer. Acad. Arts and Sciences, Vol. 37, No. 8, pp. 183–227. 22 figs. October, 1901.
128. Yerkes, R. M. — A Contribution to the Nervous System of Gonionemus murbachii. Pt. I. Amer. Jour. of Physiol., Vol. 6, No. 6, pp. 434–449. February, 1902.
129. Oppenheimer, A. — Certain Sense Organs of the Proboscis of the Polychaetous Annelid Rhynchobolus dibranchiatus. Proc. Amer. Acad. Arts and Sciences, Vol. 37, No. 21, pp. 551–569. 6 pls. April, 1902.
130. Williams, S. R. — Changes Accompanying the Migration of the Eye and Observations on the Tractus opticus and Tectum opticum in Pseudopleuronectes americanus. Bull. Mus. Comp. Zoöl., Vol. 40, No. 1, pp. 1–57. 5 pls., 7 figs. May, 1902.
131. Yerkes, R. M. — A Contribution to the Nervous System of Gonionema murbachii. Pt. II. Amer. Jour. of Physiol., Vol. 7, No. 2, pp. 181–198. May, 1902.

132. Bigelow, M. A. — The Early Development of Lepas. A Study of Cell-Lineage and Germ-Layers. Bull. Mus. Comp. Zoöl., Vol. 40, No. 2, pp. 59–144. 12 pls. July, 1902.
133. Parker, G. H. — Notes on the Dispersal of Sagartia luciæ Verrill. Amer. Nat., Vol. 36, No. 426, pp. 491–493. June, 1902.
134. Howe, F., Jr. — A Case of Abnormality in Cats' Paws. Amer. Nat., Vol. 36, No. 427, pp. 511–526. 18 figs. July, 1902.

REPORT OF THE STURGIS-HOOPER PROFESSOR OF GEOLOGY.

By William M. Davis.

Professor Davis has given two courses during the past year: the advanced course in Physiography (Geol. 20) and the half-course on the Physiography of Europe. The topics studied in the former included: River terraces, the historical development of the study of shore lines and of rivers, and the methods of treating systematic geography and regional geography. The manuscript of an article on "River Terraces in New England" has been completed for publication in the "Bulletin" of the Museum, and an abstract of it has appeared in the "American Journal of Science." Essays have been prepared on "Systematic Geography" for the general meeting of the American Philosophical Society in Philadelphia, in April last, and on "Progress in Teaching Geography" for the National Society for the Scientific Study of Education.

A broader opportunity for field work for advanced students has been felt to be so important that a fund was secured by the aid of some friends of the Department of Geology and Geography, sufficient to take two students, Mr. E. Huntington, graduate, and Mr. J. W. Goldthwait, '02, on an excursion to Utah and Arizona, where a special study was made of a region adjacent to the great Hurricane Fault. Advantage was taken of this excursion by Professor Davis to review some of his previous observations in the Grand Canyon region, to examine some of the fresh-water Tertiary formations of the Rocky Mountain region, and to visit some of the young block mountains of southern Oregon. Reports on these excursions are in preparation.

Publications by the Sturgis-Hooper Professor.

Elementary Physical Geography. Ginn & Co., Boston, 1902.

Baselevel, Grade and Peneplain. Journ. Geol., X. 1902, 77–111.

Les enseignments du Grand Canyon du Colorado. La Géographie, IV. 1901, 339–351.

The Terraces of the Westfield River, Massachusetts. Amer. Journ. Sci., XIV. 1902, 77–94.

Fieldwork in Physical Geography. Journ. Geography, I. 1902, 17–24. 62–69.

The Progress of Geography in the Schools. Yearbook Nat. Soc. Sci. Study Education, I. 1902, pp. 2, 7–49.

REPORT OF THE DEPARTMENT OF GEOLOGY AND GEOGRAPHY.

By Assistant Professor Robert De C. Ward.

The following table gives the numbers of students who took the various courses in Geology and Geography which were given during the academic year 1901–02 in the lecture rooms and laboratories of the Museum: —

Courses.	Students.	
Geology A $^{1\ \mathrm{hf}}$	66	
" B $^{2\ \mathrm{hf}}$	113	*13*
" 1 $^{1\ \mathrm{hf}}$	13	
" 5 $^{2\ \mathrm{hf}}$	164	*3*
" 7 $^{1\ \mathrm{hf}}$	31	
" 8	20	*3*
" 9 $^{2\ \mathrm{hf}}$	26	
" 14 $^{1\ \mathrm{hf}}$	75	
" 14 *a*	16	
" 15	1	
" 16 $^{1\ \mathrm{hf}}$	5	*5*
" 19 $^{1\ \mathrm{hf}}$	3	
" 20	5	*2*
" 22	17	
" 23	4	
" 24	1	
" 25 $^{2\ \mathrm{hf}}$	9	
" 5 *a*		*34*
Totals 18	569	*60*

Italics indicate students of Radcliffe College.

The only changes of note in the instruction given in the year 1901–02 as compared with that of the preceding year were the omission of Geology 11, a half-course in Oceanography, formerly given by Dr. R. A. Daly, who resigned in June, 1901, to accept a position on the Canadian Geological Survey, and the omission of Geology A from the Radcliffe list. Dr. Daly's place as Instructor in Physiography was filled by the appointment of Mr. M. Alston Read, who gave Geology A (Elementary Physiography), and also acted as Assistant in Geology 4, 14, and 14 *a*. The following acted as assistants in the various courses named: Mr. J. E. Woodman, in Courses 4, 5, and 8; Mr. F. M. Wilder, in B; and Mr. J. W. Goldthwait, in 5. In addition, Messrs. R. M. Brown, H. S. Gale, and L. E. Hunt served as student-assistants in the laboratory and field work of Geology 5, under the direction of Professor Woodworth, and Mr. Laurence La Forge acted as field and laboratory assistant in Geology 22, under Dr. T. A. Jaggar.

The summer courses in Geology and in Geography were given as usual. The course in Geology was given by Mr. J. E. Woodman, and that in Geography by Mr. H. T. Burr, assisted by Mr. F. M. Wilder. Professor Shaler gave some lectures in the former course.

By far the most important event of the year, and one of the most important events in the history of this Department, was its removal to the new southwest corner of the Museum, which has been provided, through the generosity of Mr. Alexander Agassiz and of members of his family, to serve as the future home of the Department. The building was occupied during the second half of the academic year, and now all the courses in Geology and Geography, excepting those in Mining and Economic Geology and in Palæontology, are given in the new corner-piece. In these new quarters, with abundance of room for instruction and for the storage of materials, and with many more conveniences of all kinds than it was possible to have in the more crowded quarters of the Museum of Comparative Zoölogy, where the Department has been so hospitably provided for during the past twelve years, the officers of the Department have found that their own work, and that of their students, is being done far more systematically and far more effectively than ever before. It is impossible to overestimate the value, to the Department, of the new Geological wing of the Museum.

In the basement of the new building there are ample quarters for unpacking, preparing, and storing specimens ; for modelling, and for similar work ; a dark room for photographic uses ; and a room for the electrical apparatus. On the first floor there is a spacious lecture room — one of the largest in the University — provided with ventilation which can be regulated by the lecturer on the platform, and with other conveniences. A Professor's room leads out of the lecture room.

On the second floor a large corner room has been fitted up for the use of the elementary and advanced courses in General Geology. This room contains laboratory tables, each accommodating six students, and provided with trays for materials and for notebooks. The present equipment affords accommodations for sixty-four men at once. Other tables, arranged in front of the instructor's platform, serve as desks for twenty or more students in the advanced courses. Of other furniture provided for this laboratory, mention should be made of a map case with trays for flat maps, and a covered top for rolled maps; also a specimen case containing over four hundred shallow trays, and placed in a smaller room adjoining the laboratory. This room is for the use of the Assistant Professor of Geology, and also contains accommodations for small classes.

The third floor is devoted to the Exhibition Rooms, which, when open, will form an important part of the exhibition rooms of the University Museum.

The fourth floor is devoted to Physiography, Meteorology, and Climatology. Here there is a large laboratory, similar to that on the second floor, for use in the elementary courses in Physiography and Meteorology. There are also two smaller rooms, which are to be used as lecture rooms for smaller classes, and in which the laboratory and lecture materials in Physiography and Meteorology are stored. A private room is also provided for the use of the Sturgis-Hooper Professor of Geology.

On the fifth floor a lecture room and laboratory are devoted to Experimental and Dynamical Geology, and a large corner room is provided with twenty-four separate desks, at which individual advanced students may do their work, with their books and specimens at hand, under the most favorable conditions of light and of quiet.

Altogether, very few, if any, geological departments have such spacious, convenient, and attractive quarters as those now provided for the Department of Geology and Geography of Harvard University.

Professor Shaler gave his courses along the same lines as in previous years.

Professor R. T. Jackson gave the usual laboratory course in General Palæontology (Geology 14*a*) to sixteen students. The course in Historical Geology (Geology 15) was taken by one student, and the course in Advanced Palæontology (Geology 24) was taken by one student during the first half-year. The Palæontological collections and equipment are in good condition. A new Bausch Lomb microscope was purchased. A considerable portion of the annual appropriation for Palæontology was spent on cases, etc., these expenses being the result of certain rearrangements made when the remainder of the Department of Geology and Geography moved into the new building. The Department is indebted to Mr. J. L. Pultz for some very good fossils from the Palæozoic of New York State.

Professor Ward conducted the elementary half-course in Meteorology (Geology B, 113 students); an intermediate course in Meteorology (Geology 1); and two half-courses in Climatology (Geology 19 and 25). Course B was also given to thirteen Radcliffe students. A number of important additions were made to the laboratory materials, and a new standard mercurial barometer and a Robinson cup anemometer were purchased. During the last half-year much time was spent in classifying and rearranging the meteorological and climatological books and laboratory materials in the new building. All the collections are now much more accessible than ever before. On the roof of the new Geological Section of the Museum there has been provided a small platform, on which it will be possible to expose some of the ordinary meteorological instruments, and from which observations of clouds, etc., can readily be made. As soon as the necessary funds are available, it is proposed to install a complete set of the ordinary meteorological instruments, partly upon this platform and partly in the window shelter on the fourth floor. Thus the students in meteorological courses may be given some instruction in instrumental work, which has up to this time been impossible, owing to lack of facilities in the quarters previously occupied. Professor Ward has continued his work on the translation of Hann's "Handbuch der Klimatologie," which is now in press.

Professor J. B. Woodworth gave instruction in Elementary Geology (Course 5) to 164 students. He was assisted by Messrs. Woodman, Goldthwait, Gale, Hunt, and R. M. Brown. The advanced course in General Geology was attended by twenty students. A half-course in Glacial Geology was taken by three students, and one student worked in Course 23, on the moraines at West Gloucester. A half-course of lectures was given to thirty-four students in Elementary Geology in Radcliffe College, and a half-course of laboratory and field-work was given to three Radcliffe students. The field-work in the latter course was conducted by Mr. Woodman. Professor Woodworth also gave Geology 8 to three students in Radcliffe College, and during the year was engaged in a continuation of his investigation of the Pleistocene geology of the Hudson and Champlain valleys, under the auspices of the New York State Museum. In July, 1902, he took up the detailed study and mapping of the glacial and so-called Champlain deposits of the Moore's quadrangle in that State. At the request of the State Geologist of New York, he addressed in July the Appalachian Mountain Club at Green Island, Lake George, on the geology of the Adirondack region. In the spring an address was also given before the Fall River Natural History Society on the geology of southeastern Massachusetts and Rhode Island.

Dr. T. A. Jaggar conducted, as usual, the course in advanced geological field-work (Geology 22). Owing to the increased number of mining students, this course for the second time doubled its attendance to a total of eighteen men in 1901–02; one of these left college in the middle of the year. The class made a geological survey of the whole Boston area, using new maps furnished by the United States Geological Survey. In order to make the work of so large a class efficient, the system of field-work, notes, collections, and reports was improved in various respects, and much of this improvement was planned and carried out by Mr. La Forge, who acted as Assistant in the course. Mr. La Forge continued his own field studies on the dikes of Boston and vicinity. The new laboratories on the fifth floor of the Geological wing of the Museum were fitted up during the spring with accommodation for twenty-four advanced students and with devices for draughting and storing collections; temporarily the apparatus used in Experimental Geology has been placed in the south room on this floor.

On May 12th Dr. Jaggar accompanied the Relief Expedition of the United States Steamer "Dixie" to Martinique. Dr. Palache kindly volunteered to finish the remaining lectures in Geology 9, and the completion of the work in Geology 22 was superintended by Mr. La Forge. Dr. Jaggar remained in the West Indies two months and a half, returning to the United States July 28th. Collections were made for the Museum on the slopes of the volcanoes Pelée and Soufrière in Martinique and St. Vincent, and a valuable collection of relics from St. Pierre was presented to the Museum by the Government of Martinique. A large specimen of volcanic bomb from Mont Pelée collected by Mr. G. C. Curtis has also been secured for the Museum. Mr. Curtis was associated with Dr. Jaggar in the West Indies.

Mr. Read gave the course in Elementary Physiography to sixty-six students, and acted as Assistant in Courses 4, 14, and 14*a*. He went abroad in the summer of 1902, to continue his work for the degree of Ph.D. at Munich, under Professor von Zittel.

Mr. Woodman acted as Assistant in Courses 4, 5, and 8, and in Courses 5*a* and 5*b* in Radcliffe College. He also gave a course in Glacial Geology (Geology 16) at Radcliffe, and gave a part of his time to the care of the Gardner Collection of Photographs. Mr. Woodman continued during the year to systematize the data he had collected on the gold-bearing slates of Nova Scotia, and in June, 1902, received the degree of S.D. in Geology, the title of his thesis being "Geology of the Moose River Gold District, Halifax County, Nova Scotia; together with the Pre-Carboniferous History of the Meguma Series." Mr. Woodman resigned his position as Assistant in Geology in July, to accept the Assistant Professorship of Geology and Mineralogy at Dalhousie College, Halifax, Nova Scotia. The special task has been assigned him of building up a mining school at that institution.

The following Publications by Officers of the Department were issued during the Year.

BY R. DE C. WARD.

Some Economic Aspects of the Heat and Drought of July, 1901, in the United States. Bull. Amer. Geogr. Soc., XXXIII. 1901. pp. 338–347.

Physiological Effects of Diminished Air Pressure. Science, N. S., XIV. 1901. p. 814.

Eine Wichtige Studie über Sonnenfinsterniss-meteorologie. Naturwissenschaftliche Rundschau, Braunschweig, XVI. 1901. pp. 481–482.

Iridescent Clouds. Science, N. S., XVI. 1902. pp. 32–33.

Current Notes on Meteorology. Science (throughout the year).

Reviews in Annales de Géographie; Popular Science Monthly; Science; Journal of Geography.

BY J. B. WOODWORTH.

Pleistocene Geology of Portions of Nassau County and Borough of Queens. Bulletin 48, New York State Museum. pp. 617–670. 1901.

The Atlantic Coast Triassic Coal-fields. 22d Annual Report U. S. Geol. Survey, Part III. pp. 25–53. Washington, D. C. 1902.

BY T. A. JAGGAR, JR.

Field Notes of a Geologist in Martinique and St. Vincent. Appleton's Popular Science Monthly. Aug., 1902.

REPORT ON THE MAMMALS.

By Outram Bangs.

The chief work in the collection of mammals during the year has been that of combining the different collections in the Museum into a single series, making over the old skins, and weeding out useless material and duplicates. Excellent progress has been made along these lines with the aid of Miss Parker and Mr. Nelson. By gift, exchange, and purchase, one hundred and twenty-five specimens with skulls have been added to the collection. A number of new storage cases have been installed, allowing a better arrangement of the collections for reference and study. Material has been loaned to Dr. J. A. Allen, M. W. Lyon, Jr., C. Hart Merriam, G. S. Miller, Jr., E. W. Nelson, W. N. Osgood, G. H. Parker, E. A. Preble, and S. N. Rhoads. The gifts to the collection are from A. Agassiz, O. Bangs, Frank Bostock, W. E. Castle, J. T. Clark, C. W. Dimick, and G. W. Nelson.

I have published during the year: —

In the Auk : —

On a Collection of Birds made by W. W. Brown, Jr., at David and Divala, Chiriqui. Vol. XVIII. pp. 355–370. 1901.

In the American Naturalist : —

The Mammals collected in San Miguel Island, Panama, by W. W. Brown, Jr. Vol. XXXV. No. 416. pp. 631–644. 1901.

In the Bulletin of the Museum : —

Chiriqui Mammalia. Vol. XXXIX. No. 2. pp. 18–51. 1902.

In The Proceedings of the New England Zoölogical Club : —

Description of a New Woodpecker from Chiriqui. Vol. II. pp. 99–100. 1901.

On a Second Collection of Birds made in Chiriqui by W. W. Brown, Jr. Vol. III. pp. 15–70. 1902.

Two New Birds from San Miguel Island, Bay of Panama. Vol. III. pp. 71–73. 1902.

Descriptions of Two New Insular Blarinas from Eastern Massachusetts. Vol. III. pp. 75–78. 1902.

Descriptions of Ten New Birds from the Santa Marta Region of Colombia. Vol. III. pp. 81–90. 1902.

REPORT ON THE BIRDS.

By William Brewster.

The additions to our bird collection during the past year are as follows: Four hundred and fifty-three skins from Borneo, Sumatra, New Guinea, and other islands of the Malay Archipelago, obtained by exchange from Dr. Otto Finsch, of the Rijks Museum at Leyden, Holland; one hundred and five skins from the Liu Kiu Island, bought of Alan Owston and prepared by Ishida Zensaku and other Japanese collectors; one hundred and fifty-six skins and two alcoholic specimens of New Zealand birds, bought of S. Dannefaerd, of Auckland; about ninety sterna of North American birds collected and presented by Dr. A. K. Fisher; five skins obtained at the Maldive Islands by Mr. H. P. Bigelow (on Mr. Agassiz's last expedition); a White Pelican (*Pelecanus erythrorhynchus*), and a Cassowary (*Casuarius australis*), received by gift from "Bostock's Animal Arena"; a mounted Penguin (*Spheniscus mendiculus*), taken at the Galapagos Islands and purchased from the Frank Blake Webster Company; a Fish Hawk (*Pandion haliaëtus carolinensis*), shot at Arlington, Massachusetts, on September 20, 1901, and presented by Mr. F. Lamkin; and an abnormal egg of the Robin (*Merula migratoria*), the gift of Mr. Harold P. Bowditch.

A number of Swallows and Pipits have been sent to Mr. Robert Ridgway for study and comparison in connection with his forthcoming work on the Birds of North and Middle America. With the assistance of Miss Parker the skins in the North American collection have been re-arranged, so as to bring together within each series, (1) birds of the same sex, and (2) those from the same localities. During the progress of this task many duplicate skins have been extracted for use in future exchanges.

I have published during the year: —

In the Auk: —

An Ornithological Mystery.

Nesting of the Carolina Wren (*Thyothorus ludovicianus*) in Southern Massachusetts.

An Undescribed Form of the Black Duck (*Anas obscura*).

In Proceedings of the New England Zoölogical Club: —

On the Occurrence of Cory's Least Bittern (*Ardetta neoxena*) in Eastern Massachusetts.

In Forest and Stream: —

Second Occurrence of the Black Brant (*Bernicla nigricans*) in Massachusetts.

In Bird Lore: —

Voices of a New England Marsh.

REPORT ON THE REPTILES, BATRACHIANS, AND FISHES.

By Samuel Garman.

Among the additions to the collections are a lot of rare reptiles, batrachians, and fishes, from the Maldive Islands, collected by the members of Mr. Agassiz's Expedition. Other contributions were made by Messrs. Outram Bangs, J. H. Blake, Frank Bostock, of the Animal Arena, H. S. Gale, A. F. Gotthold, R. H. Howe, Jr., Dr. W. C. Kendall, Wm. D. McPherson, A. P. Morse, J. T. Nichols, and J. D. Sornborger. The largest single accession is a lot of one hundred and eighty-one specimens of California reptiles and batrachians obtained by exchange with Prof. J. O. Snyder. Another exchange with Dr. Bashford Dean secured valuable species of fishes from Japan. The purchases include two of the very large mounted specimens of the Galapagos tortoises, from Mr. Frank Webster, a fine series of Floridan tortoises from C. J. Maynard, and small lots or single specimens from other collectors. Some material was furnished the students for study and for preparations. A few larval Batrachia were sent to Dr. B. G. Wilder as an exchange. A number of mounted specimens have been prepared for the exhibition rooms by Mr. George Nelson. The entire storage collection of Reptilia and Batrachia has been overhauled and put in improved condition. The fishes also have received considerable attention.

Besides articles not signed, I have published a paper on "Reptiles and Batrachians from Australasia," in the "Bulletin" of the Museum, and a preliminary, on "Genera and Families of the Chimæroids," in the Proceedings of the New England Zoölogical Society.

REPORT ON THE ENTOMOLOGICAL DEPARTMENT.

By Samuel Henshaw.

For acceptable gifts to the collections of the Department the Museum has to thank Mrs. Ethel Adams, Miss C. G. Soule, Messrs. Alexander Agassiz, G. M. Allen, A. L. Babcock, W. A. Baldwin, Outram Bangs, Frederick Blanchard, R. S. Breed, William Brewster, Henry Brooks, August Busck, R. V. Chamberlain, T. D. A. Cockerell, Walter Deane, J. H. Emerton, H. C. Fall, W. G. Farlow, C. E. Faxon, Samuel Garman, Roland Hayward, J. S. Hine, Ralph Hoffmann, R. H. Howe, Jr., J. G. Jack, L. H. Joutel, C. W. Leng, E. L. Mark, A. L. Melander, A. P. Morse, J. T. Nichols, A. S. Packard, G. H. Parker, W. M. Scott, S. H. Scudder, E. J. Smith, J. B. Smith, J. D. Sornborger, Roland Thaxter, P. R. Uhler, A. E. Verrill, H. P. Walcott, C. P. Whitney, E. B. Williamson, and W. McM. Woodworth.

The more noteworthy accessions are: 1st, a considerable number of insects, principally Lepidoptera from Labrador (*purchase*); 2d, the Maldive and Ceylonese insects and spiders, one of the results of the latest expedition of Mr. Agassiz; 3d, Dr. Roland Thaxter's choice collection of Heterocera, chiefly noctuid and bombycine; and 4th, an extensive series of the early stages of Rhopalocera given by one of the most constant and liberal contributors to the Departmental collections, Mr. S. H. Scudder. Mr. Scudder's gift includes the material used as the basis for his classic "Butterflies of New England." Baron Osten Sacken, in returning some entomological correspondence loaned him several years ago, has generously added many letters of Loew written between 1877 and 1879, together with a number of his own letters that were returned to him after the death of Loew. This correspondence has a direct and important value in relation to the collections of Diptera.

Four new cases and 200 new boxes have been received and utilized.

A revisional rearrangement of a large part of the tineid moths has been completed; also the dipterous families Sapromyzidæ and Empidæ, portions of the Silphidæ and Scarabæidæ of the Coleoptera, and of the Æschnidæ of the Odonata. Progress has been made in the rearrangement of the Araneinæ, and in the assortment and identification of the alcoholic material from the islands of the Tropical Pacific.

REPORT ON THE DEPARTMENT OF VERTEBRATE PALÆONTOLOGY.

By Charles R. Eastman.

Field-work in the Colorado and Wyoming collecting regions was resumed by the Assistant during the summer of 1901, with the twofold object of making additions to the Museum collections, and of studying the physical and stratigraphic relations of the Green River and other well-known fossiliferous horizons. A large number of exposures were visited with a view to determining whether the beds in question were of lacustrine origin, as has been commonly assumed, or of fluviatile, as recently suggested by Professor Davis. In so far as the Green River shales are concerned, the evidence seems to point conclusively in favor of Hayden's original hypothesis that they were deposited at the bottom of former lake basins; but with regard to the Jurassic Dinosaur bone-beds, there are various reasons for supposing many of them to have been formed under fluviatile conditions.

A number of valuable fresh-water fishes were obtained from the Middle Eocene of Uinta County, Wyoming, and a quantity of the usual type of Trenton and Jurassic fish-remains were collected near Cañon City, Colorado. An excellent opportunity for acquiring a knowledge of local stratigraphy was afforded by participating in the ten days' excursion through Colorado which was conducted by Professors Emmons and Van Hise immediately preceding the Denver meeting of the Geological Society of America. Some time was spent by the Assistant in examining the principal western collections of fossil vertebrates both last year and during the present summer, particular attention being given to the type specimens described by Newberry and Worthen and by St. John and Worthen in the "Palæontology of Illinois." The results of a reinvestigation of some of these historic specimens are included in a forthcoming number of the Museum "Bulletin."

The Assistant has been occupied during the greater part of the year with routine work and with the publication of the results of his studies of Palæozoic fish-remains belonging to this and other institutions. Several advantageous exchanges have been made, and a considerable quantity of material has been received by gift or purchase, as will be noted in the following list of accessions. Material has also been loaned for study, Professor Osborn having borrowed all of our better preserved titanothere skulls, and some reptilian remains belonging to the Whitney Collection having been sent to Dr. J. C. Merriam, of California University. The collections have been consulted a number of times by students from other institutions, and thanks are due in particular to Dr. George F. Eaton, of Yale, for his aid in working up our large representation of Triassic fishes. Of the latter, very extensive collections were made by the New Jersey Geological Survey in the vicinity of Boonton, New Jersey, and placed at the disposal of this Museum by Dr. H. B. Kümmel, Director of the Survey.

At the late meeting of the Geological Society of America the Assistant was appointed a delegate to represent the Society at the Hugh Miller Centenary to be held at Cromarty, in connection with which a visit to the leading Old Red Sandstone localities in Scotland is contemplated. The Assistant expects to remain some further time abroad, having for his primary object the study of the principal foreign collections of fossil fishes.

Additions to the Collection during the Year.

1901. A collection of Trenton and Jurassic fish-remains from the vicinity of Cañon City, Colorado, and Green River fishes from Uinta County, Wyoming, obtained partly by the Assistant and partly by purchase from local collectors.

1901. A small collection of fish and amphibian remains from the Coal Measures of Jefferson County, Iowa, presented by Professor J. A. Udden, of Augustana College, Rock Island. Received Nov. 5.

1901. Ward Collection. A valuable assortment of Silurian and Devonian fish-remains, chiefly from Scotland and from the Corniferous of New York State. Purchased.

1902. New Jersey Geological Survey Collection. A very large collection of Newark fishes from the vicinity of Boonton, New Jersey, in part loaned for study and in part presented by the Director, Dr. Henry B. Kümmel. Received April 22.

1902. A small collection of Tertiary sharks' teeth from Warna, Bulgaria. Presented by H. Aznanoorian. Received July 31.

1902. Portion of the skeleton of a single individual of *Corax falcatus* Ag. from the Niobrara Cretaceous of Logan County, Kansas; collected by C. H. Sternberg. Purchased.

Papers published during the Year.

On Edestus, Helicoprion, Acanthodes, Ctenacanthus and other Permo-Carboniferous Sharks (Science, N. S., Vol. XIV. p. 795), 1901.

Campyloprion, a New Form of Edestus-like Dentition (Geol. Mag. [4], Vol. IX. pp. 148–152), 1902.

Some Carboniferous Cestraciont and Acanthodian Sharks (Bull. Mus. Comp. Zoöl., Vol. XXXIX. pp. 51–100), 1902.

Correspondence [Critique of W. Patten's "Structure and Classification of the Tremataspidæ"] (Amer. Nat., Vol. XXXVI. pp. 505–507), 1901.

The Carboniferous Fish-Fauna of Mazon Creek, Illinois (Journ. Geol., Vol. X. pp. 450–454), 1902.

REPORT ON THE LIBRARY.

By Samuel Henshaw.

During the year, August 1, 1901, to July 31, 1902, 1,129 volumes, 2,042 parts of volumes, 2,375 pamphlets, and 37 maps have been added to the library.

These accessions added to the number of volumes and pamphlets reported last year give the library a total of 34,458 volumes and 28,194 pamphlets.

The additions to the library this year, as in recent years, have been derived very largely from two sources ; namely, those received in exchange for the publications of the Museum and others the direct gift of Mr. Agassiz. Two additional sources are to be noted this year : first, a considerable number of books and pamphlets from the library of the late Professor Hyatt ; and, secondly, eighty volumes purchased from the income of the Willard Peele Hunnewell Memorial Fund.

849 volumes have been bound ; 400 pamphlets have been separately bound.

Progress in enumerating and cataloguing the Whitney library and in collating the serials may be noted.

[A]

PUBLICATIONS

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

FOR THE ACADEMIC YEAR 1901-1902.

Bulletin: —

- Vol. XXXVII.
  - No. 3. Contributions from the Zoölogical Laboratory. No. 126. The Regenerating Nervous System of Lumbricidæ and the Centrosome of its Nerve Cells. By HERBERT W. RAND. 82 pp. 8 Plates. September, 1901.
- Vol. XXXVIII. Geological Series, Vol. V.
  - No. 5. The Geology of the Northeast Coast of Labrador. By REGINALD A. DALY. 68 pp. 13 Plates. February, 1902.
  - No. 6. Leucite-Tinguaite from Beemerville, New Jersey. By JOHN E. WOLFF. 7 pp. February, 1902.
- Vol. XXXIX.
  - No. 1. Some Reptiles and Batrachians from Australasia. By SAMUEL GARMAN. 14 pp. 2 Plates. November, 1901.
  - No. 2. Chiriqui Mammalia. By OUTRAM BANGS. 37 pp. April, 1902.
  - No. 3. Some Carboniferous Cestraciont and Acanthodian Sharks. By C. R. EASTMAN. 47 pp. 7 Plates. June, 1902.
- Vol. XL.
  - No. 1. Contributions from the Zoölogical Laboratory. No. 130. Changes accompanying the Migration of the Eye, and Observations on the Tractus opticus and Tectum opticum in Pseudopleuronectes americanus. By STEPHEN R. WILLIAMS. 57 pp. 5 Plates. May, 1902.
  - No. 2. Contributions from the Zoölogical Laboratory. No. 132. The Early Development of Lepas. A Study of Cell-Lineage and Germ-Layers. By MAURICE A. BIGELOW. 86 pp. 12 Plates. July, 1902.

Memoirs: —

- Vol. XXV.
  - No. 1. Uintacrinus: Its Structure and Relations. By FRANK SPRINGER. 89 pp. 8 Plates. August, 1901.
- Vol. XXVI.
  - No. 1. Reports on the Scientific Results of the Expedition to the Tropical Pacific, 1899-1900. I. Preliminary Report and List of Station. By ALEXANDER AGASSIZ. With Remarks on the Deep-Sea Deposits. By SIR JOHN MURRAY. 114 pp. 21 Charts. January, 1902.
  - No. 2. Reports on the Scientific Results of the Expedition to the Tropical Pacific, 1899-1900. II. Some Species of Partula from Tahiti. A Study in Variation. By ALFRED G. MAYER. 21 pp. 1 Plate. January, 1902.

No. 3. Reports on the Scientific Results of the Expedition to the Tropical Pacific, 1899–1900. III. Medusæ. By Alexander Agassiz and Alfred G. Mayer. 40 pp. 13 Plates. 1 Chart. January, 1902.

Vol. XXVII.

No. 1. Reports on the Results of Dredgings by the United States Coast Survey Steamer "Blake." XXXIX. Les Dromiacés et Oxystomes. Par Alphonse Milne Edwards et E. L. Bouvier. 127 pp. 25 Plates. April, 1902.

No. 2. Reports on the Results of Dredgings by the United States Coast Survey Steamer "Blake." XL. Les Bathynomes. Par Alphonse Milne Edwards et E. L. Bouvier. 47 pp. 8 Plates. July, 1902.

Report: —

1900–1901. 33 pp. November, 1901.

[B]

INVESTED FUNDS OF THE MUSEUM.

In the Hands of the Treasurer of Harvard College, Sept. 1, 1901.

Sturgis-Hooper Fund	$100,000.00
Gray Fund	50,000.00
Agassiz Memorial Fund	297,933.10
Teachers and Pupils Fund	7,594.01
Permanent Fund	117,469.34
Humboldt Fund	7,740.66
Virginia Barret Gibbs Fund	5,000.00
Willard Peele Hunnewell Memorial Fund	5,000.00
	$590,737.11

The payments on account of the Museum are made by the Bursar of Harvard College, on vouchers approved by the Keeper. The accounts are annually examined by a committee of the Overseers. The only funds the income of which is restricted, the Gray and the Humboldt Funds, are annually charged in an analysis of the accounts, with vouchers to the payment of which the income is applicable.

The income of the Gray Fund can be applied to the purchase and maintenance of collections, but not for salaries.

The income of the Virginia Barret Gibbs Scholarship Fund, of the value of $250, is assigned annually with the approval of the Faculty of the Museum, at the recommendation of the Professor of Zoölogy and of Comparative Anatomy in Harvard University, "in supporting or assisting to support one or more students who have shown decided talents in Zoölogy, and preferably in the direction of Marine Zoölogy."

The income of the Humboldt Fund (about $300) can be applied for the benefit of one or more students of Natural History, either at the Museum, the United States Fish Commission Station at Wood's Hole, or elsewhere.

Applications for the tables reserved for advanced students at the Wood's Hole Station should be made to the Faculty of the Museum before the 1st of May. Applicants should state their qualifications, and indicate the course of study they intend to pursue.

The following Publications of the Museum of Comparative Zoölogy are in preparation: —

Reports on the Results of Dredging Operations in 1877, 1878, 1879, and 1880, in charge of ALEXANDER AGASSIZ, by the U. S. Coast Survey Steamer "Blake," as follows: —

E. EHLERS. The Annelids of the "Blake."
C. HARTLAUB. The Comatulæ of the "Blake," with 15 Plates.
H. LUDWIG. The Genus Pentacrinus.
A. MILNE EDWARDS and E. L. BOUVIER. The Crustacea of the "Blake."
A. E. VERRILL. The Alcyonaria of the "Blake."

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of ALEXANDER AGASSIZ, on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., Commanding.

Illustrations of North American MARINE INVERTEBRATES, from Drawings by BURKHARDT, SONREL, and A. AGASSIZ, prepared under the direction of L. AGASSIZ.

LOUIS CABOT. Immature State of the Odonata, Part IV.
E. L. MARK. Studies on Lepidosteus, continued.
" On Arachnactis.
R. T. HILL. On the Geology of the Windward Islands.
W. McM. WOODWORTH. On the Bololo or Palolo of Fiji and Samoa.
A. AGASSIZ and A. G. MAYER. The Acalephs of the East Coast of the United States.
AGASSIZ and WHITMAN. Pelagic Fishes. Part II., with 14 Plates.
J. C. BRANNER. The Coral Reefs of Brazil.

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieutenant Commander Z. L. TANNER, U. S. N., Commanding, in charge of ALEXANDER AGASSIZ, as follows: —

A. AGASSIZ. The Pelagic Fauna.
" The Echini.
" The Panamic Deep-Sea Fauna.
K. BRANDT. The Sagittæ.
" The Thalassicolæ.
C. CHUN. The Siphonophores.
" The Eyes of Deep-Sea Crustacea.
W. H. DALL. The Mollusks.
H. J. HANSEN. The Cirripeds.
W. A. HERDMAN. The Ascidians.
S. J. HICKSON. The Antipathids.
W. E. HOYLE. The Cephalopods.
G. VON KOCH. The Deep-Sea Corals.
C. A. KOFOID. Solenogaster.
R. VON LENDENFELD. The Phosphorescent Organs of Fishes.
H. LUDWIG. The Starfishes.
J. P. McMURRICH. The Actinarians.
E. L. MARK. Branchiocerianthus.
JOHN MURRAY. The Bottom Specimens.
P. SCHIEMENZ. The Pteropods and Heteropods.
THEO. STUDER. The Alcyonarians.
M. P. A. TRAUSTEDT. The Salpidæ and Doliolidæ.
E. P. VAN DUZEE. The Halobatidæ.
H. B. WARD. The Sipunculids.
H. V. WILSON. The Sponges.
W. McM. WOODWORTH. The Nemerteans.
" The Annelids.

PUBLICATIONS

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

AT HARVARD COLLEGE.

There have been published of the BULLETIN Vols. I. to XXXVII.; of the Memoirs, Vols. I. to XXIV.

Vols. XXXVIII., XXXIX., XL., and XLI. of the BULLETIN, and Vols. XXV., XXVI., XXVII., and XXVIII. of the MEMOIRS, are now in course of publication.

The BULLETIN and MEMOIRS are devoted to the publication of original work by the Professors and Assistants of the Museum, of investigations carried on by students and others in the different Laboratories of Natural History, and of work by specialists based upon the Museum Collections and Explorations.

The following publications are in preparation: —

Reports on the Results of Dredging Operations from 1877 to 1880, in charge of Alexander Agassiz, by the U. S. Coast Survey Steamer "Blake," Lieut. Commander C. D. Sigsbee, U. S. N., and Commander J. R. Bartlett, U. S. N., Commanding.

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieut. Commander Z. L. Tanner, U. S. N., Commanding, in charge of Alexander Agassiz.

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of Alexander Agassiz, on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., Commanding.

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